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SHORT COMMUNICATION

The Correct Author Citation of *Gigantopteris* (Fossil Plant)

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The authorship of the generic name *Gigantopteris* remains notoriously confusing, although the gigantopterids have been extensively reported from the Late Paleozoic and the early Mesozoic of Asia and North America. Here, it is elucidated that Hisakatsu Yabe was the first to validly publish the name *Gigantopteris*, originally proposed by August Schenk. The author of the genus name should therefore be cited as *Gigantopteris* Yabe, or *Gigantopteris* Schenk ex Yabe. Previous author citations ascribed to *Gigantopteris* are incorrect.

Key words: author citation, fossil plant, *Gigantopteris*, Permian, valid publication

Gigantopteris and *Gigantopteris*-like plants, generally known as the gigantopterids, have been extensively reported by paleobotanists and geologists from the Late Paleozoic and the early Mesozoic of Asia and North America (Zeiller 1907, Yabe 1908, 1917, White 1912, Asama 1959, Li & Yao 1983, Mamay 1986, Li & Taylor 1998, Sun & Chandra 1998, Yao & Liu 2002, Glasspool *et al.* 2004, Liu & Yao 2002, 2004). The author citation for the genus *Gigantopteris* is notoriously confusing in the paleobotanic literature. Authorship has been variously ascribed to 'Schenk' (White 1912, Halle 1927, Chang 1930, Shimakura 1940, Boersma & Broekmeyer 1987), to 'Schenk ex Potonié' (Koidzumi 1936, Glasspool *et al.* 2004), or to '(Schenk) Asama' (Boureau & Doubinger 1975). It seems that the ghost of false information has haunted the literature for many years. The main purpose of this paper is to clarify the authorship of *Gigantopteris*.

In the 1870s, Ferdinand von Richthofen collected some remarkable fossil fronds from a coal pit near "Lui-Pa-Kòu," Hunan Province, China [presently, Nibakou, Yongxing County, Hunan Province] (see Yao 1983). Richthofen's collection was submitted to August Schenk, who published a new genus and species, *Megalopteris nicotianifolia* (originally as *nicotianaefolia*, which is standardized here by Arts. 60.8 and 60G.1 of the ICBN [McNeill *et al.* 2006]), for an apparently large leaf resembling the leaf of the cultivated tobacco (Schenk 1883). The original specimens are preserved in the Museum of Natural History, Humboldt University, Berlin (see Glasspool *et al.* 2004).

Soon after publication of *Megalopteris nicotianifolia*, Schenk learned that the generic name *Megalopteris* (Dawson) Andrews (1875) had been used previously for an Early Carboniferous fern-like leaf, so he autographically substituted the new name *Gigantopteris* in the copy of his own paper (see Benecke *et al.* 1883). In their review of Schenk's (1883) paper, Benecke *et al.* (1883) did not accept the name *Gigantopteris*, but instead assigned *M. nicotianifolia* to the earlier published *Idiophyllum* Lesquereux (1880), which was based upon only a fragment of fern-like foliage from the Carboniferous of North America. Schenk (1888) himself followed Benecke *et al.*'s (1883) generic assignment and autographically substituted the name *Idiophyllum* in a copy of his 1883 paper presented to René Zeiller (see White 1912). Potonié (1900) treated *Gigantopteris* as a later taxonomic synonym of *Idiophyllum* Lesquereux. According to Arts. 29.1 and 34.1 (a), Schenk had never effectively published the name *Gigantopteris*, and Potonié did not validate it. Thus, the authorship of *Gigantopteris* should not be cited as "Schenk" or "Schenk ex Potonié" (see Arts. 46.2 and 46.3).

Neither Benecke *et al.* (1883) nor Potonié (1900) associated the epithet *nicotianifolia* with the generic name *Idiophyllum*, so their statements do not constitute valid publication of the combination *I. nicotianifolium* (under Art. 33.1). Sellards (1902) demonstrated that *Idiophyllum rotundifolium* Lesquereux actually represented the immature frond of *Neuropteris rarinervis* Bunbury (1847), so the monotypic *Idiophyllum* Lesquereux became a taxonomic synonym (see White 1912, Wang *et al.* 1996). *Neuropteris rarinervis* was later placed in a new genus, as *Laveineopteris rarinervis* (Bunbury) Cleal *et al.* (1990), representing a Carboniferous neuropteroid leaf. *Megalopteris nicotianifolia* is saliently different from *Idiophyllum rotundifolium* Lesquereux and *Laveineopteris rarinervis* (Bunbury) Cleal *et al.* in its complex reticulately veined foliage. Hence, the original material described by Schenk (1883) as *Megalopteris nicotianifolia* were still in need of a new name.

Of vital importance to the valid publication of *Gigantopteris* is a brief note in an inconspicuous *Miscellaneous report* in the *Journal of the Geological Society of Tokyo*, vol. 11, on *Megalopteris nicotianifolia* Schenk published by Yabe (20 April 1904). Hisakatsu Yabe concisely reviewed the nomenclatural history of *Megalopteris nicotianifolia* and accepted the names *Gigantopteris* and *G. nicotianifolia* for the first time. Therefore, according to Art. 46.4 of the ICBN, *Gigantopteris* should be ascribed to Yabe, or Schenk ex Yabe, with the type being *G. nicotianifolia* (Schenk) Yabe (Art. 7.3). The author citation, *Gigantopteris* (Schenk) Asama 1959 (see Boureau & Doubinger 1975), is therefore incorrect. Based on the above nomenclatural history, the following note is necessary:

Gigantopteris Schenk ex Yabe in J. Geol. Soc. Tokyo 11: 160. Apr. 1904.

Type: *Gigantopteris nicotianifolia* (Schenk) Yabe [≡ *Megalopteris nicotianifolia* Schenk in F. von Richthofen, China 4: 238, pl. 32, fig. 6. 1883, '*nicotianaefolia*'].

Lectotype: MB.Pb.2002/989 (see Glasspool *et al.* in Palaeontology 47: 1356, fig. 1. 2004).

Repository: Museum of Natural History, Humboldt University, Berlin.

Locus typicus: China, Hunan Province, Yongxing County, Nibakou.

Stratum typicum: Permian.

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References

Andrews, E. B. 1875. Descriptions of fossil plants from the Coal Measures of Ohio. Rep. Geol. Surv. Ohio 2: 413–426.

Asama, K. 1959. Systematic study of so-called *Gigantopteris*. Sci. Rep. Tohoku Imp. Univ., Ser. 2, Geol. 31: 1–72.

Benecke, E. W., E. Weiss & H. T. Geyler. 1883. Review of "A. Schenk: Pflanzen aus der Steinkohlenformation, S. 211–244 mit Taf. XXX–XLV". Neues Jahrb. Mineral. Geol. 2: 256–257.

Boersma, M. & L. M. Broekmeyer. 1987. Index of figured plant megafossils Permian 1976–1980. Review Palaeobot. Palynol. 53: 11–139.

Boureau, É. & J. Doubinger. 1975. Traité de Paléobotanique IV(2): 1–768. Masson et C^{ie}, Paris.

Bunbury, C. J. F. 1847. On fossil plants from the coal formation of Cape Breton. Quarterly J. Geol. Soc. London 3: 423–438.

Chang, H.-C. 1930. Permian plants collected by Messrs. Chu Tingoo and Hsü Jui Ling from the La-Shih-Pa and Tien-Lo-Chung coal-fields North-East of Chü-Chiang, Kwangtung. Geol. Surv. Kwangtung Kwangsi Palaeontol. Mem. 1: 1–8.

Cleal, C. J., C. H. Shute & E. L. Zodrow. 1990. A revised taxonomy for Palaeozoic neuropterid foliage. Taxon 39: 486–529.

Glasspool, I., J. Hilton, M. E. Collinson & S.-J. Wang. 2004. Defining the gigantopterid concept: a reinvestigation of *Gigantopteris* (*Megalopteris*) *nicotianaefolia* Schenk and its taxonomic implications. Palaeontology 47: 1339–1361.

Halle, T. G. 1927. Palaeozoic plants from central Shansi. Palaeontol. Sin., Ser. A, 2: 1–316.

Koidzumi, G. 1936. On *Gigantopteris* flora. Acta Phytotax. Geobot. 5: 130–139.

Lesquereux, L. 1880. Description of the coal flora of the Carboniferous formation in Pennsylvania and throughout the United States. Second Geological Survey of Pennsylvania: Report of Progress 1: 1–354.

Li, H.-Q. & D. W. Taylor. 1998. *Aculeovinea yunguiensis* gen. et sp. nov. (Gigantopteridales), a new taxon of gigantopterid stem from the Upper Permian of Guizhou Province, China. Int. J. Pl. Sci. 159: 1023–1033.

Li, X.-X. & Z.-Q. Yao. 1983. Current studies of gigantopterids. Palaeontol. Cathayana 1: 319–326.

Liu, L.-J. & Z.-Q. Yao. 2002. Comparison in leaf architecture between Chinese and American species of *Gigantopteridium*. Acta Palaeontol. Sin. 41: 322–333.

Liu, L.-J. & Z.-Q. Yao. 2004. *Fujianopteris*: a new genus of gigantopterid plants from South China. Acta Palaeontol. Sin. 43: 472–488.

Mamay, S. H. 1986. New species of Gigantopteridaceae from the Lower Permian of Texas. Phytologia 61: 311–315.

McNeill, J., F. R. Barrie, H. M. Burdet, V. Demoulin, D. L. Hawksworth, K. Marhold, D. H. Nicolson, J. Prado, P. C. Silva, J. E. Skog, J. H. Wiersema & N. J. Turland. 2006. International Code of Botanical Nomenclature (Vienna Code) adopted by the Seventeenth International Botanical Congress Vienna, Austria, July 2005 (Regnum Vegetabile 146: 1–568). A. R. G. Gantner Verlag, Ruggell, Liechtenstein.

Potonié, H. 1900. Über die fossilen Filicales im Allgemeinen und die Reste derselben zweifelhafter Verwandtschaft. *In*: Engler, A. & K. Prantl (eds.), Die Natürlichen Pflanzenfamilien 1(4): 473–515. Verlag von Wilhelm Engelmann, Leipzig.

Schenk, A. 1883. Pflanzen aus der Steinkohlen-Formation. *In*: Richthofen, F. F. von (ed.), Beiträge zur Paläontologie von China 4: 211–244. Verlag von Dietrich Reimer, Berlin.

Schenk, A. 1888. Die fossilen Pflanzenreste. Handb. Bot. 4: 1–270.

Sellards, E. H. 1902. On the validity of *Idiophyllum rotundifolium* Lesquereux, a fossil plant from the Coal Measures at Mazon Creek, Illinois. Amer. J. Sci., Ser. 4, 14: 203–204.

Shimakura, M. 1940. Permian plants from the Lungtan coal field, Kiangsu, China. J. Shanghai Sci. Inst., Sect. 2, 3: 1–21.

Sun, K.-Q. & S. Chandra. 1998. Evolution and ecology of the Cathaysia flora. Palaeobotanist 47: 20–28.

Wang, J., H.-Q. Liu, Y.-D. Wang & G.-L. Shen. 1996. On the concept of "Cathaysia flora" and its applied limit. Bull. Bot. Res. 16: 175–178.

White, D. 1912. The characters of the fossil plant *Gigantopteris* Schenk and its occurrence in North America. Proc. U. S. Natl. Mus. 41: 493–516.

Yabe, H. 1904. *Megalopteris nicotianaefolia.* J. Geol. Soc. Tokyo 11: 159–160.

Yabe, H. 1908. On the occurrence of the genus *Gigantopteris* in Korea. J. Coll. Sci. Imp. Univ. Tokyo 23: 1–8.

Yabe, H. 1917. Geological and geographical distribution of *Gigantopteris*. Sci. Rep. Tohoku Imp. Univ., Ser. 2, 4: 61–73.

Yao, Z.-Q. 1983. The type locality and topotypes of *Gigantopteris nicotianaefolia* Schenk. Acta Palaeontol. Sin. 22: 1–8.

Yao, Z.-Q. & L.-J. Liu. 2002. Discovery of dichotomously forked gigantoperid fronds from China, with special comparison between Asian and American gigantoperids. Acta Palaeontol. Sin. 41: 308–321.

Zeiller, R. 1907. Note sur quelques empreintes végétales des gites de charbon du Yunnan Méridional. Annales de Mines, Sér. 10, 11: 472–494.

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